Observations on the breeding habits of the Bronzewinged Jaçana [*Metopidius indicus* (Latham)]

BY

D. N. MATHEW

Research Assistant, Bombay Natural History Society[1]

INTRODUCTION

It is recorded that among Jaçanas the role of the sexes is reversed to a great extent. Miller (1925) found this in the Mexican Jaçana [*Jaçana spinosa* (Linné)] and Hoffmann (1949) in the Pheasant-tailed Jaçana [*Hydrophasianus chirurgus* (Scopoli)]. In the latter the female is larger in size than the male and is polyandrous, and the male carries out most (or all) of the incubation and care of young. In the Bronzewinged Jaçana [*Metopidius indicus* (Latham)] also the female is slightly larger than the male and the pattern of breeding is similar to that of the Pheasant-tailed Jaçana.

FIELD NOTES

From 23 July to 9 October 1963 I had the opportunity to observe the breeding habits of the Bronzewinged Jaçana at a freshwater tank situated at the Powai Unit of Aarey Milk Colony in Salsette Island, Bombay. Observations were made with a pair of 8×30 binoculars. Duration of observations was over two hours on alternate days, and extended to seven hours on holidays.

The tank is a natural body of water more or less oblong in shape and approximately 4500 sq. metres in area. It is overhung by gulmohur and mango trees and its vegetation has been altered by man. Introduced para grass is the dominant plant on the nesting sites. Waterlily (*Nymphaea pubescens*) and a floating species of *Ipomoea* also occur.

---

[1] Present address: Department of Zoology, Faculty of Science, M. S. University, Baroda

The observations were on three adult birds (two males and one female) which bred at the tank. The female was distinguished by its slightly larger size and the second male (B) by a gap in its right wing caused by the loss of a number of primaries. These three birds did not tolerate any other Bronzewinged Jaçana on the tank, and I could distinguish them at every stage even though the birds were not individually marked.

When I started watching on July 23 the female had already paired with the male with undamaged wing (male A) and a clutch of 4 eggs had been completed. No courtship was observed between the pair. The nest was built on an isolated patch of floating grass about a foot square in area. The grass provided good camouflage to the brooding bird, male A.

July 23-27 (3 observations):

During this period, only this couple was on the tank. Male A incubated consistently, leaving the nest only for feeding. The female vigorously defended the territory, chasing away waterhens and pond herons. The pair would exchange contact notes. Once when turtles moved near the nest (there were about six turtles resident in the tank) the female stood guard near the nest.

The male was always on the nest when observations were completed for the day at 18 to 19.30 hours, and apparently spent the night on the nest while the female roosted some six feet away in floating grass.

July 29 to August 13 (10 observations):

The second male Bronzewinged Jaçana (B) started visiting the tank. Male A left his eggs and chased the intruder and pecked him furiously, time and time again. The female appeared to be indifferent to the new arrival. Male B established a territory in the southern half of the tank in spite of A's 'threat-postures' against him. By August 3, the two males appeared to have demarcated their territories by an imaginary line running east and west and roughly bisecting the tank. I marked this boundary visually by a Gulmohur tree on the eastern margin of the tank. If one male went about two yards beyond this border the other would fight him. Male A continued to incubate consistently, never leaving the nest for a period longer than 30 minutes. I never saw the female incubating or taking any interest in the chicks which appeared on August 13, 20 days after commencement of observation. Male A looked after the chicks.

On August 3, the males fought each other 4-5 times during the 6

hours of observation and were pecked by the female till they stopped fighting.

The female also chased the males after the fight. On this day B was seen collecting nest-material and for the first time the female was seen soliciting him. Covering did not take place, but it was certain that the female had accepted B as a breeding partner. By the middle of September this pair produced three clutches of eggs.

Clutch 1. *August* 3 *to* 19. (7 *observations*):

Male B and the female collected bits of grass and *Ipomoea* from almost everywhere in the southern half of the tank (B's territory), but very little of the material was used for the nest. Their first nest was a poorly-concealed waterlily leaf with a few grass blades thrown here and there. The female solicited on seven occasions and was covered by B. Between August 13 and 19, three eggs were laid and B started incubating. Unlike A he did not brood very consistently and the eggs disappeared on August 21.

Clutch 2. *August* 21 *to September* 1. (6 *observations*):

The female and B working jointly built another nest about 6 feet away from their first. Between these dates I observed four instances of coition, each after the female had solicited. On August 28 two eggs were observed with B brooding inconsistently. He was also seen covering the female whenever she presented. Male B and the female would sometimes leave the tank for about an hour, 2 to 3 times a day, possibly for the purpose of feeding. It was noted that the female would be the first to leave the tank on such trips and would be away from the tank for a longer period than the male. The nest was as crudely constructed and as poorly concealed as the one before, and suffered a similar fate. By September the second clutch of eggs disappeared.

Clutch 3. *September* 2 *to* 26. (10 *observations*):

On September 2 the pair (B and the female) was building again, this time in a thick patch of para grass in the southern margin. Material was gathered very inconsistently and from all over the territory. Between September 2 and 7 the female solicited eight times while I was observing and was covered. B incubated from September 10 to 24 but lost his clutch of eggs after this date. After September 14 the female was not seen at the tank. B continued to defend his territory till the end of September. After September 30 he left the tank.

With the disappearance of his neighbour, Male A (who had been looking after his three chicks) occupied the entire tank and, when last observed, he was feeding with three chicks in the former territory of Male B.

General Observations

Territory:

Each male Bronzewinged Jaçana had a territory of over 2000 sq. metres (approx.) which he defended vigorously from every bird other than his female partner. One male would not let his neighbour into his territory but would try to use his neighbour's territory whenever the owner was temporarily away. The female defended the territories of the two males and could feed anywhere.

Defensive displays:

Whenever one male entered the territory of his neighbour, or when a male found that his neighbour was likely to trespass, the owner moved to the threatened border and struck threat postures, standing with stretched neck and, often, open wings. Each male moved in a zigzag manner and repeated the display. If the intruder did not withdraw, there ensued furious pecking. Whenever the female was near by she pecked them apart. The fighting birds sometimes went under water and, till the birds emerged, a soggy mess of intertwined wings popped up from time to time. Such a fight occupied 2 to 5 minutes. When the fighting males emerged the female chased and pecked them. In 98 hours of observations the males made 102 defensive displays against one another, and 12 of these ended in fights.

The female defended the territories of the two males from birds of other species like pond herons, whitebreasted waterhens, and lesser whistling teals. When predatory birds approached, the female produced a wheezy piping call and agitatedly flew about, but no instance of attacking was seen. The female stood guard near the nest for periods up to half an hour whenever turtles passed near it. Throughout the period of observation the female defended the whole area of the tank, irrespective of the territories of the males.

Injury simulation:

Male B, whenever he was pecked by the female following a fight with A, let his wings sag and produced the whistling call creating the impression (on the observer) that he was injured.

Courtship activities:

The female periodically attained peaks of sexual excitement. She postured before the male. Her body became rigid and she stood absolutely still with her vent raised towards the male. The male responded to this display by covering her. I have observed only two instances (out of 19) when the male did not respond to soliciting. The female postured for a minute and resumed feeding. Such a display by the female and the consequent covering occupied a space of two minutes, out of which 30 to 45 seconds were used for coition. I have observed coition between 1.30 p.m. and 7 p.m. only, except on a solitary occasion. All were prompted by the hen.

Nest building:

Both sexes shared building and also did a lot of purposeless collecting of material. Out of the four nests seen this season one was on a patch of grass (above some 8 ft. depth of water) just about 3 to 4 inches above water-level. Two were built on waterlily leaves above 12 to 15 ft. depth of water. The fourth was in a thick patch of grass but barely out of water.

Displacement activities ? :

The Bronzewinged Jaçanas indulged in some incongruous activities. Are these displacement acts? (1) When a brooding male was disturbed by an intruder, he leaped 3 to 4 feet into the air calling agitatedly. This act was repeated several times and apparently called attention to the nest rather than away from it. (2) Immediately after coition the female pulled out nesting material for a few minutes; such material was rarely used for the nests.

Call notes:

Sálim Ali (1961) has distinguished two types of calls, 'a short harsh grunt; also a wheezy piping *seek-seek-seek* etc. Both sexes used these calls in the same contexts, but the female's voice had more depth. The grunt was used as a contact note by the breeding pairs, and also when a bird left the tank or returned to it. The second, asthmatic call was often produced when the birds were disturbed by intruders or were fighting one another.

Incubation:

The pattern of incubation of the two males was different. Male A used 54.3% of the time (in 30 hours of observation) for incubation, 16.9% for feeding, and the rest for preening, defending, etc. Male B

incubated only 15.7% (of 34½ hours of observation), and used 24.8% for feeding, and the rest for other activities. On an average, incubating males left their nests 3.5 times per hour.

Parental care:

The chicks were looked after entirely by the male. He conducted them for feeding in his territory, and in the neighbour's territory whenever the latter was temporarily away. The male frequently harboured the chicks under his wings. The female did not show any concern for the chicks.

Conclusions

A single season's observations on three adult birds are hardly sufficient to warrant definite conclusions. However, the following points are noteworthy:

(1) The male and female showed a difference in sexual excitability. The female periodically appeared to attain peaks of sexual excitement when she solicited copulation by posturing before the male. The male responded to 89% of these postures by covering. No such display by the male, or for that matter no other courtship action by either sex was observed. Huxley (1923) has pointed out that such disparity in sexual excitability in species with sexual dimorphism has the function of regulating coition. More sustained observations and of larger marked populations would determine whether both sexes of Bronzewinged Jaçanas indulge in courtship actions.

(2) When eggs are lost after the commencement of incubation, the pair revert to coition and nest-building once again. Huxley (1923) has recorded this reversal of behaviour in his discussion of evolution of breeding behaviour in birds.

(3) The males are very aggressive in the defence of their breeding territories.

(4) The female's territory covered the whole breeding area and her defensive action was directed against intruders of other species only. (In this case, however, there were no rival females.)

(5) The female policed the aggressive behaviour of the males against each other.

Comparing these observations on the Bronzewinged Jaçana with those of Hoffmann (1949) on the Pheasant-tailed Jaçana, one finds the following points in common:

(1) The female is larger in size and is polyandrous. A single female pairs with different males one after the other;

(2) Incubation and care of the young is done almost entirely by the male;

(3) The female defends the territory vigorously;

(4) The two sexes use the same type of calls in similar contexts; and the following points of difference:

(1) Hoffmann observed a single male Pheasant-tailed Jaçana rearing two to three families in a season and the parent-chick relation slackening in the second week. In the only brood of Bronzewinged Jaçanas that survived, the chicks were looked after by the male parent even after they were two months old. I did not observe a male Bronzewinged Jaçana rearing more than one family.

(2) Hoffmann has recorded that a single female produced 3-4 clutches within a month, or from 7 to 10 clutches within one season. The female studied this season produced, in all 4 clutches of 3-4 eggs within 2½ months.

(3) Hoffmann refers to very exceptional cases where the female shared incubation and care of young. No such instance was observed in the cases studied. More sustained observations are necessary to test this possibility.

Acknowledgements

I am indebted to Dr. Sálim Ali, Shri Humayun Abdulali, and to Shri J. C. Daniel for their guidance without which I could not have undertaken this work. Shri Abdulali kindly made his canoe available to me at the site of observation. I am grateful to my colleague Shri P. B. Shekar for his assistance. Shri Honkan, the Assistant Agricultural Officer in charge of the Powai Unit, and his staff were very helpful. I record my gratitude to them.

Summary

The female Bronzewinged Jaçana is larger than the male and is polyandrous. The female paired with two males one after the other. She did not share parental duties, but defended the breeding area vigorously. No courtship behaviour by the male was observed. The female solicited copulation by posturing near the male. Both sexes shared building, but the male alone incubated. When a clutch of eggs was lost after the commencement of incubation the pair reverted to coition and nest-building.

References

Ali, Sálim (1961) : The Book of Indian Birds : 85. Bombay Natural History Society.

Hoffmann, Alfred E. (1949) : *Zoologischer Jahrbücher*, Band **78**, Heft 4, Jena, 5 Sept. 1949.

Huxley, Julian S. (1923) : Courtship Activities in the Redthroated Diver (*Colymbus stellatus* Pontopp.). *J. Linn. Soc.* **35** : 253-292.

Miller, Alden H. (1925) : Observations on the Incubation and the Care of the Young in Jaçana. *Condor* **33** : 32-33.